Abstract:

The simplest, most effective, and most economical way to introduce fresh air in homes with central forced air systems is to use the central fan to pull in and distribute a controlled amount of outside air.
Central Fan Integrated Supply Ventilation – The Basics

The simplest, most effective, and most economical way to introduce fresh air in homes with central forced air systems is to use the central fan to pull in and distribute a controlled amount of outside air. The most efficient approach to central fan integrated supply ventilation involves two patented processes.

**FAN CYCLING:** Fan cycling assures that the central air handler fan will run enough to distribute ventilation air and evenly mix air throughout the house, even when there is no demand for heating or cooling. But rather than operate the fan continuously or by a simple timer, the FanCycler™ method factors in prior operation—it does not run the central fan for ventilation when operation for heating or cooling has already accomplished the necessary ventilation and mixing. In this way, the FanCycler™ method saves energy as well as wear and tear on equipment.

**VENTILATION DAMPER CYCLING** – Integrating a motorized ventilation damper with fan cycling limits the potential for over-ventilation and saves the energy of unnecessarily conditioning this “extra” outside air. The damper opens when the fan comes on, but if the fan stays on longer than needed for the introduction of ventilation air, the damper automatically closes. The damper is simply re-cycled for as long as the fan continues to operate.

While BSC strongly recommends fan cycling with motorized damper control, the climate region where it is most important is hot-humid (because of the energy associated with moisture-laden outside air).

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1 The fan and damper cycling methods described here are protected by one or more of the following patents: US 5,547,017; 5,881,806; 6,431,268 CA 2,245,135.
For more information on these systems, go to the following commercial web site: http://www.fancycler.com.

For more information on climate-specific mechanical ventilation, see: http://www.buildingscience.com.
Central-fan-integrated supply ventilation
Interior closet or basement configuration
Central-fan-integrated supply ventilation
Unvented-cathedralized attic configuration
OA intake from sidewall to return box with motorized damper
Central-fan-integrated supply ventilation
Unvented-cathedralized attic configuration
OA intake through soffit to sidewall
Central-fan-integrated supply ventilation
Unvented-cathedralized attic configuration
With extended return duct collar for increased OA intake
Central-fan-integrated supply ventilation
Unvented-cathedralized attic configuration
With media filter and motorized damper
Central-fan-integrated supply ventilation
Interior mechanical closet, sidewall return configuration

- Thermostat
- Fan Cycling and Motorized Damper Control
- Control Wiring Terminals
- Central System Supply Air
- Heating Apparatus
- Air Distribution Fan
- Air Handler Unit
- Return air plenum
- Filter grille assembly with 1” cloth pleated filter
- Manual Damper
- Interior Wall
- Cooling Apparatus
- Filter
- 6” Insulated Outside Air Duct (slope up for first 4’ in snow country)
- Motorized Damper (optional)
- Exterior Wall
- Wall Cap with Insect Screen
- Ventilation Air Intake (locate away from pollutant sources)
- Exterior Wall
- Filter grille assembly with 1” cloth pleated filter
- Central System Return Air
- Floor

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Central-fan-integrated supply ventilation
With dehumidification separate from cooling
Warm-humid climate, interior mechanical closet configuration

- Thermostat
- Fan Cycling and Motorized Damper Cycling Control
- Central System Supply Air
- Control Wiring Terminals
- Central Fan
- Air Handler Unit
- Duct extension at air handler return (open at bottom)
- Remote Dehumidistat (optional)
- 40 pint/day dehumidifier
- 6" Insulated Outside Air Duct
- Exterior Wall
- Wall Cap with Insect Screen
- Ventilation Air Intake (locate away from pollutant sources)
- Heating Apparatus
- Cooling Apparatus
- Central System Return Air
- Filter
- Motorized Damper (to control open time)
- Manual Damper (to adjust flow rate)
- RR-0825: CFIS Figures

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